REFLECTED NOISE ANALYSIS FOR THE SHIP CANAL BRIDGE

Presented by:

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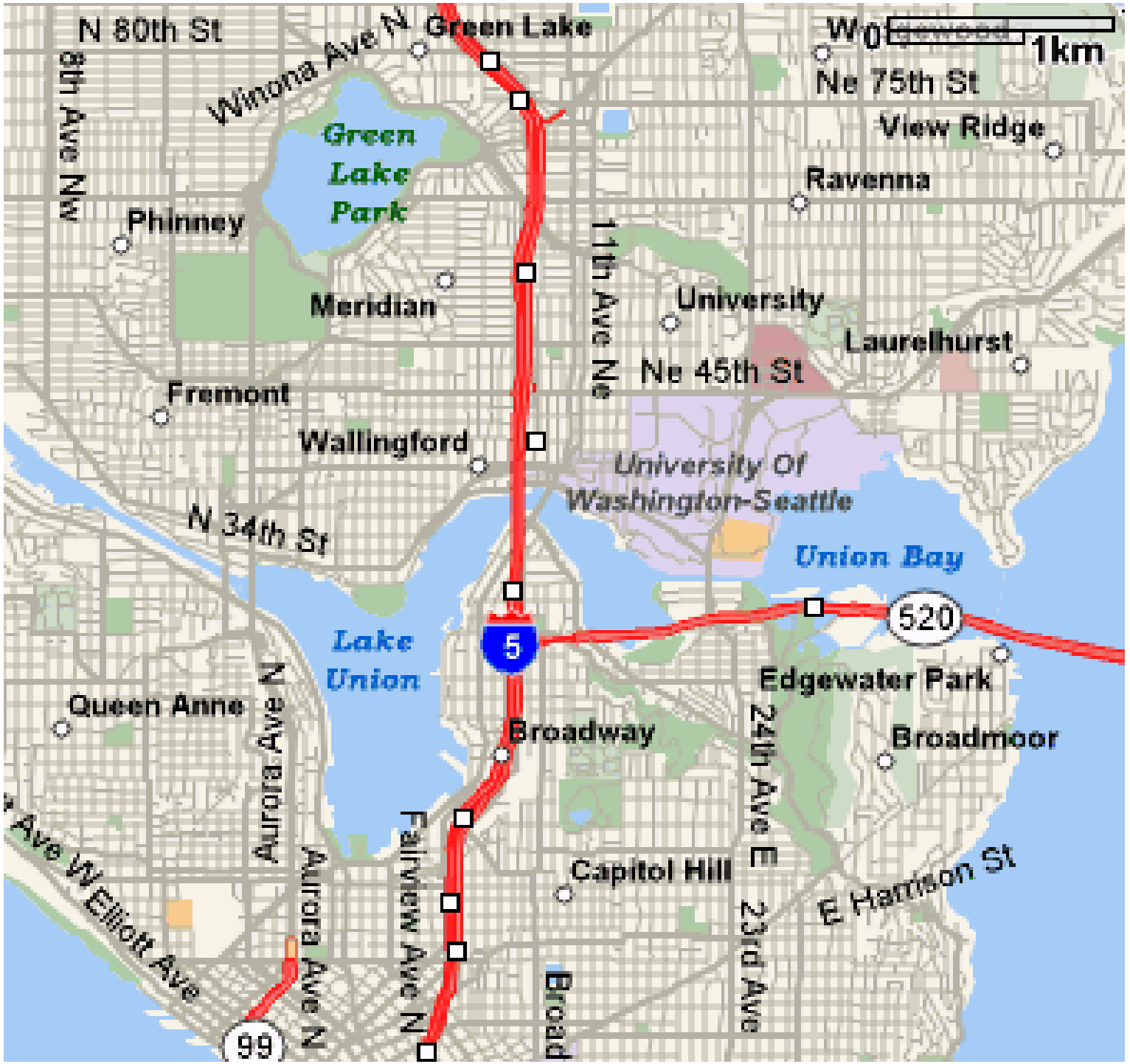
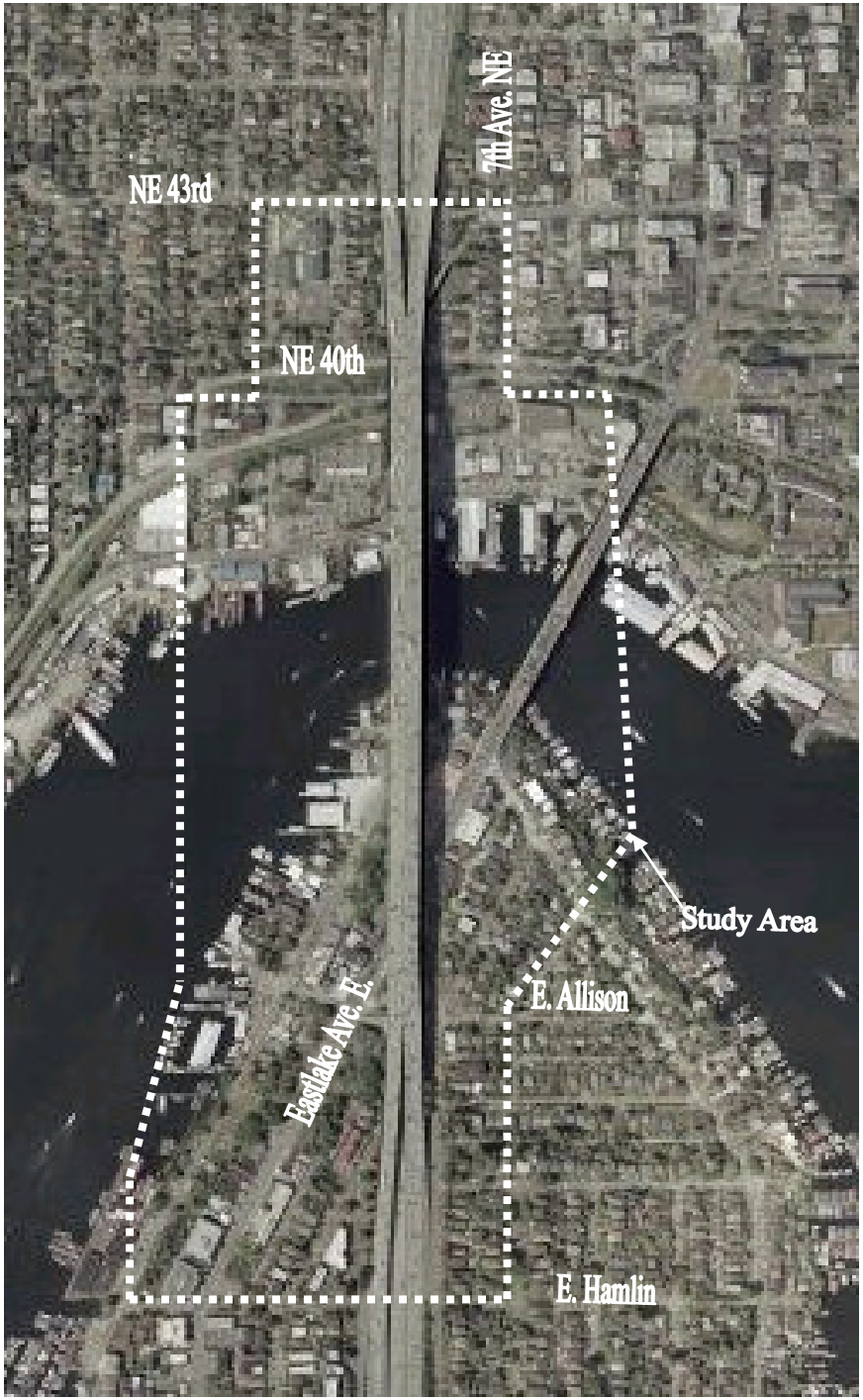

N 80th St
Winona Ave N
Green Lake
W
1km
Ne 75th St
View Ridge
Ravenna
8th Ave Nw
Green Lake Park
Phinney
Meridian
11th Ave Ne
University
Laurelhurst
Ne 45th St
Fremont
Wallingford
University Of Washington-Seattle
N 34th St
Union Bay
520
Lake Union
5
Edgewater Park
Queen Anne
Broadway
Broadmoor
24th Ave E
Aurora Ave N
Fairview Ave N
Capitol Hill
E Harrison St
23rd Ave
W Elliott Ave
99

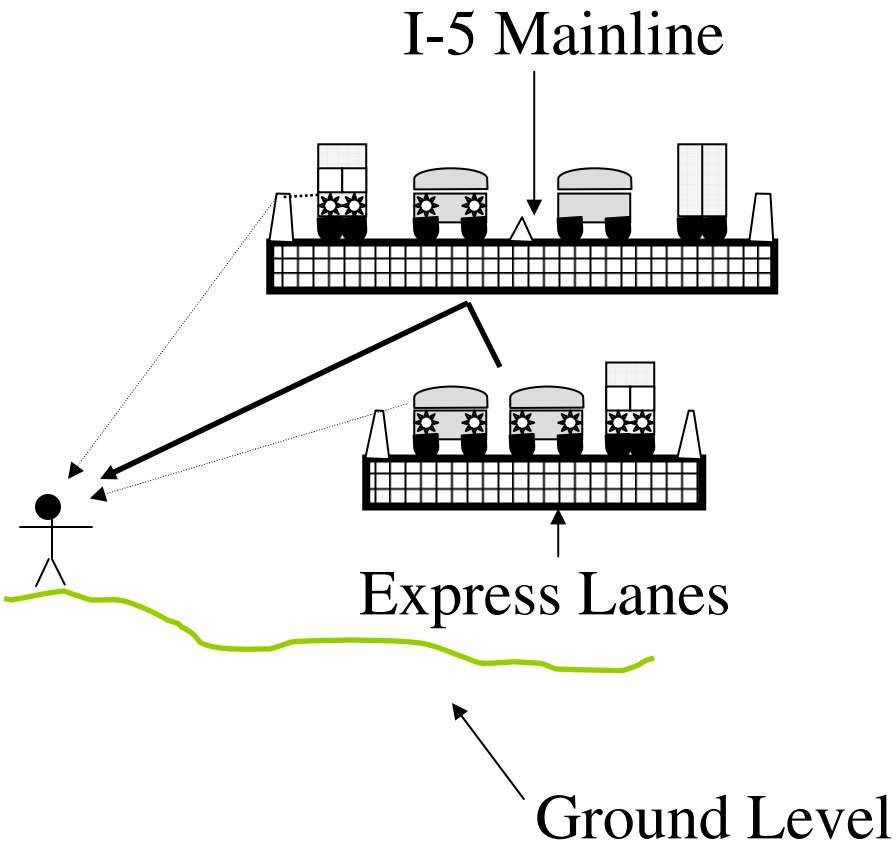

NE 43rd
7th Ave. NE
NE 40th
Study Area
E. Allison
Eastlake Ave. E.
E. Hamlin

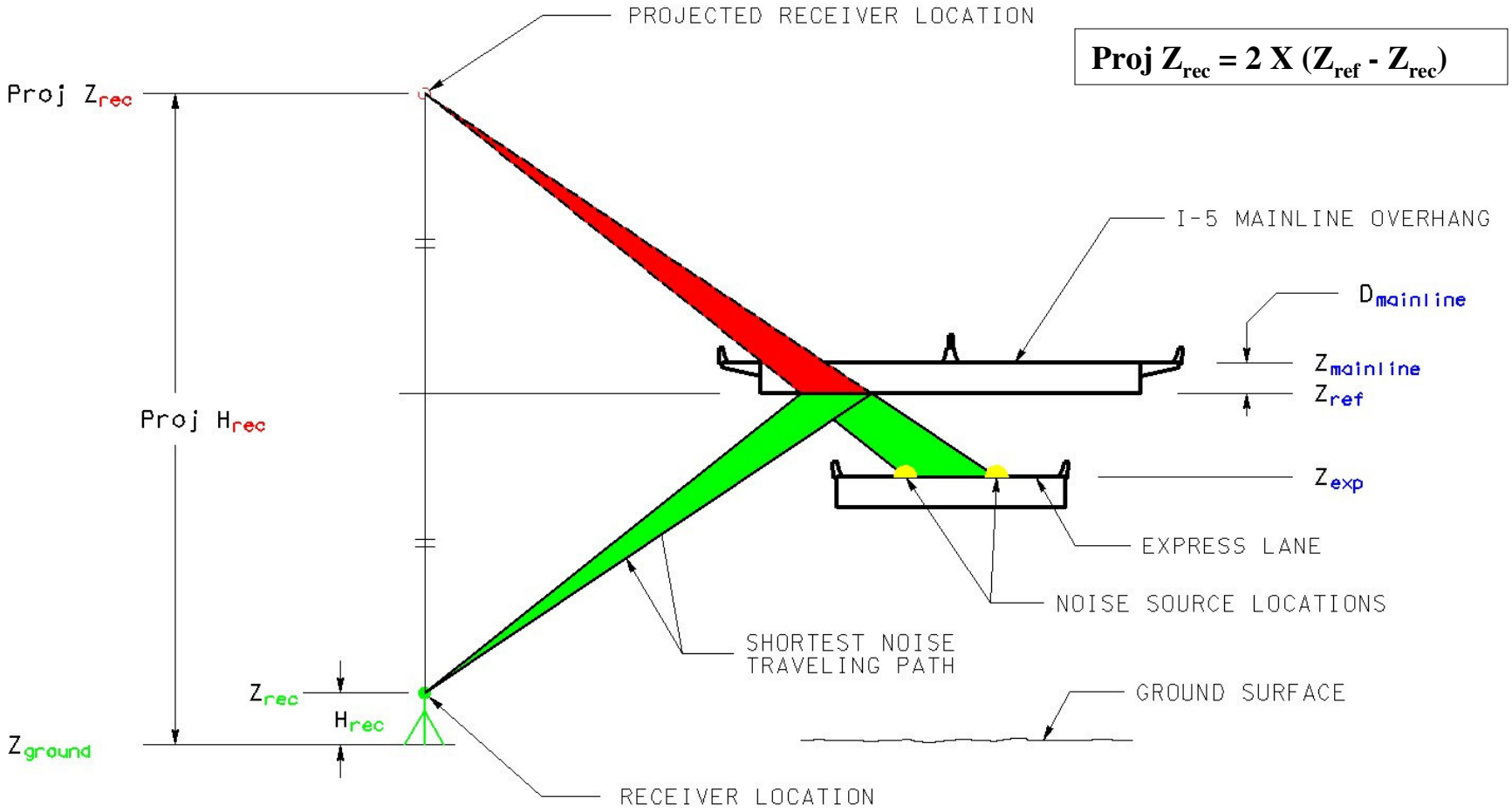
How did we get here?

- 1997 Community requested noise study
- 1998 N.O.I.S.E formed (**N**eighborhood **O**pposing **I**nterstate **S**ound **E**xposure)
- January 2004 initial study completed
- December 2004 recent study completed

How did we model the bridge?

- Calibrated and Validated model
- Created direct path model including mainline and express lanes
- Created separate reflected path model with elevated receivers and no mainline
- Logarithmically added direct and reflected noise results
- Applied noise reduction coefficient
- Modeled each quadrant separately


I-5 Mainline
Express Lanes
Ground Level



Proj H_{rec} - HEIGHT OF THE VIRTUAL RECEIVER

Proj Z_{rec} - TOP ELEVATION OF THE VIRTUAL RECEIVER (A MIRROR REFLECTION OF TRUE RECEIVER)

H_{rec} - RECEIVER HEIGHT (5 FEET)

Z_{rec} - TOP ELEVATION OF THE TURE RECEIVER

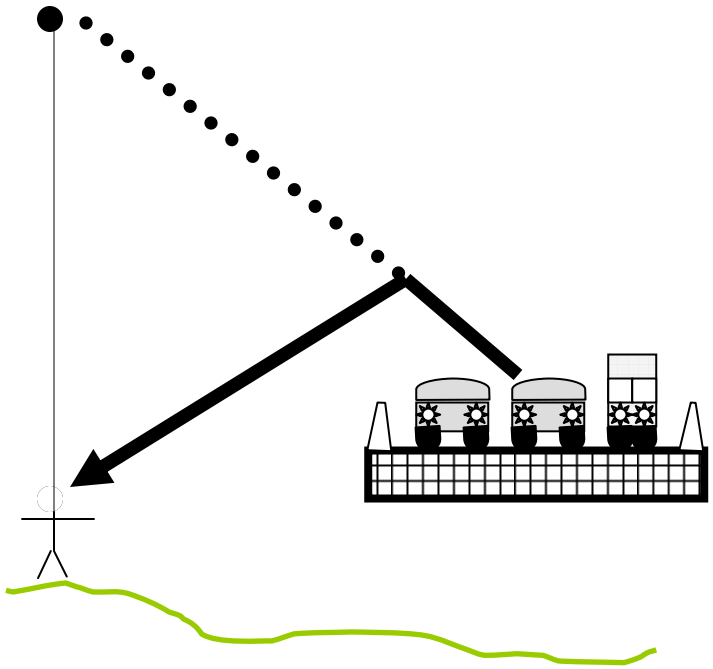
Z_{ground} - ELEVATION OF RECEIVER AT GROUND LEVEL

$Z_{mainline}$ - ELEVATION AT MAINLINE ROADWAY SURFACE

$D_{mainline}$ - DEPTH OF THE UPPER DECK CONCRETE GIRDER

Z_{ref} - ELEVATION AT THE REFLECTION SURFACE

Z_{exp} - ELEVATION AT THE EXPRESS LANE ROADWAY SURFACE



New Receiver Height

Mainline Elevation

Modeling cont'd

- Modeled five noise wall scenarios (each material)
  - Reflective wall panels only
  - Absorptive wall panels only
  - Absorptive ceiling panels only
  - Reflective walls + absorptive ceiling panels
  - Absorptive walls + absorptive ceiling panels

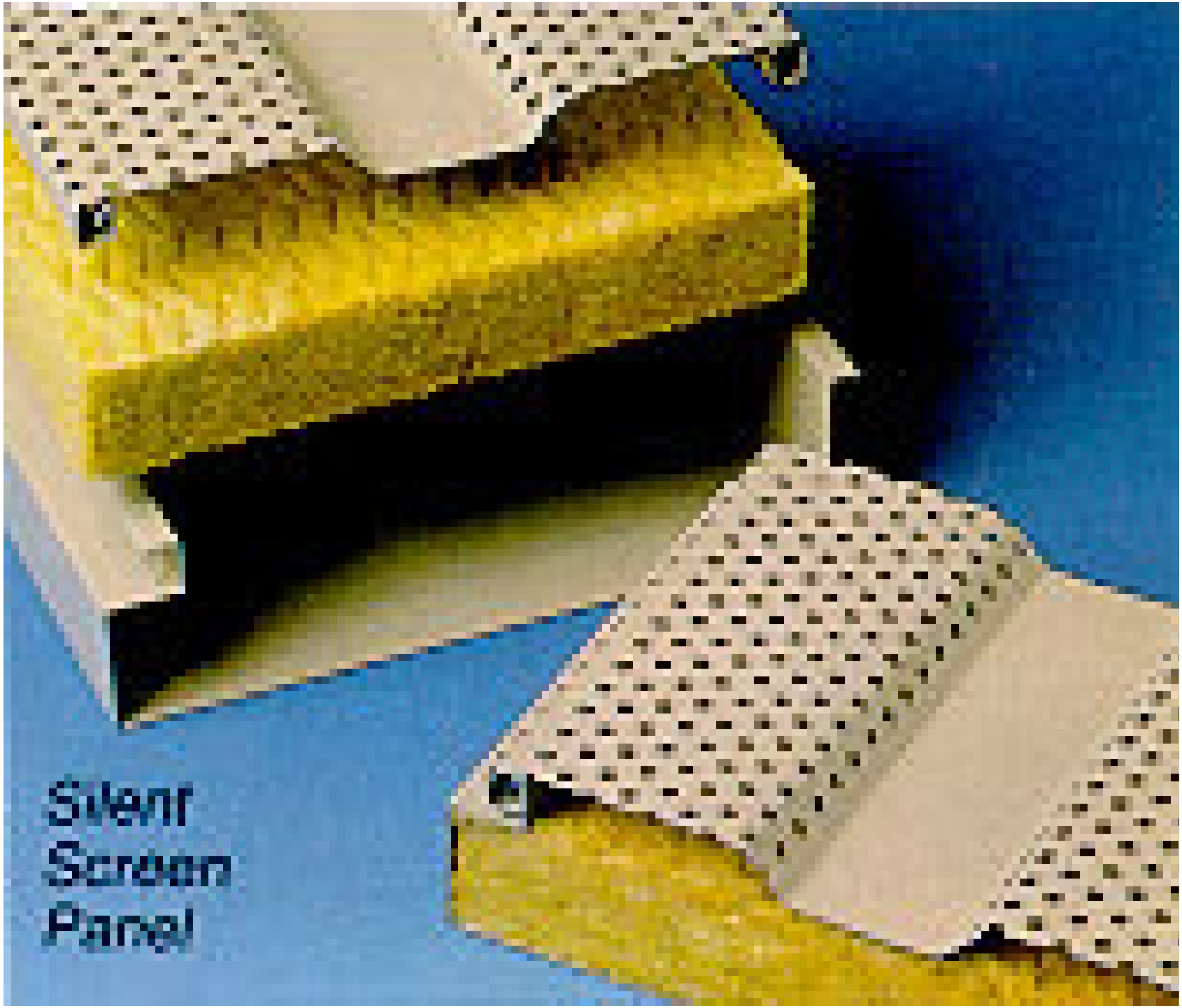
Which noise wall materials did we model?

REFLECTIVE

- Paraglass (R)
- Quilite (R)

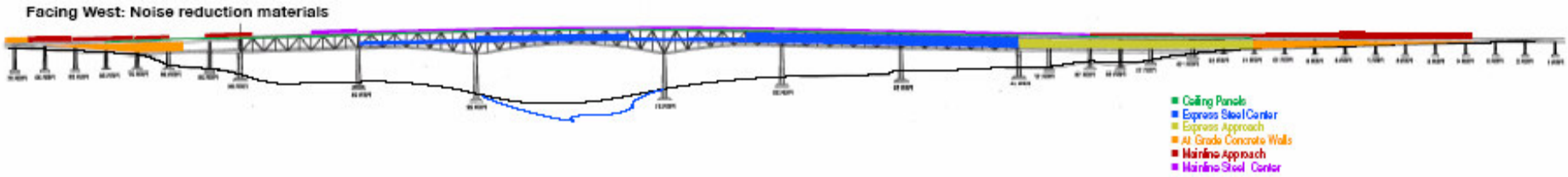
ABSORPTIVE

- Acoustax
- Silent Screen
- Noise Shield
- Sound Fighter
- Carsonite

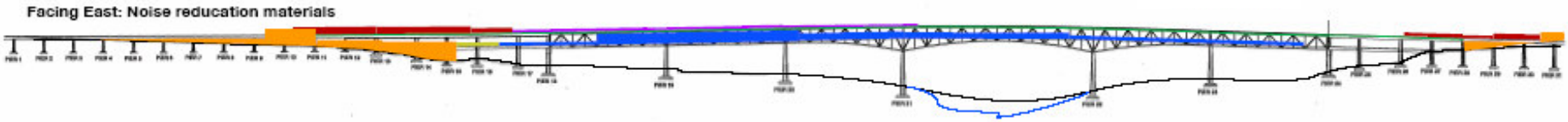

Silent
Screen
Panel

What were our results?

- Acoustax / Silent Screen gave the best noise reductions
- 13 – 19 dB noise reductions modeled
- Bridge ranks 10th on Retrofit List



West Side Noise Walls



East Side Noise Walls

What issues still remain?

- Access for UBIT
- Wind loading of mainline and express lanes
- Structural rehabilitation
- Materials not crash tested / approved
- Visual concerns of public

What are the next steps?

- May 2005 received $5 Million for further study
  - Testing noise wall materials
  - Bridge structural analysis
  - Additional noise modeling
  - 90% PS&E by 2009

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